"New Mobilities and Old Problems. Tourist Flows and Low-Cost Airlines in the Balearic Islands and Spain[1]"

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Abstract

Transport is a fundamental component of an economic and spatial model based on tourism because it acts as an interface between tourists' countries of origin and holiday destinations. The Western Mediterranean, one of the world market's top tourist destinations, is seeing the effects of changes and trends in tourism associated with post-modern hypermobility, characterized by fragmented holidays, affordable prices and the widespread use of the Internet, which is partly responsible for the emergence of a new mode of air traffic: low-cost airlines. In the Balearic Islands, these airlines are clearly one of the most recent, noteworthy innovations in air transport and tourism. They have brought about qualitative and quantitative changes in air travel and airline companies by boosting mobility and accessibility, not just for visitors but also for residents. The increase in air traffic is added to other pre-existing problems and leads us to consider its main impacts too.

Keywords: *Transport, low-cost airlines, tourism, Balearic Islands*

Paper Type: *Scientific study*

1. Introduction

Tourism is one of the macro forces involved in globalization, either in its capacity as a means of standardizing the world, as a social phenomenon that highlights local peculiarities, cultures and identities, or as an element in local-versus-global dialectics, facilitating the emergence of new systems of social and political power (Teo and Li 2003). In a globalized tourism scenario, transport and communications are key components of the logistics chain, ensuring the mobility of people, goods and information (Woudsma and Andrey 2004).

Without going so far as to give an exhaustive list of all the causes that have contributed to the recent growth in travel and its consequences, mention can be made of technological developments; more accessible, more diversified means of transport; the spread and more extensive use of information technologies; a combination of an increase in individual income, decrease in travel costs, and more vacation time; the compartmentalization and greater flexibility of holidays; new demographic patterns (including a longer life expectancy); political changes in some countries that have boosted the tourist industry within their jurisdictions; and emigration in search of employment, which subsequently boosts tourist mobility. All these reasons, which can be summarized as widespread access to mobility by a large part of the Western population, explain the huge growth in tourism demand and the scope of its geographic coverage (Seguí 2007).

Most tourists still live in more developed areas and they mainly travel within these same areas, and so proximity, convenience, familiarity and a lower price (which does not always coincide with a shorter distance) prevail even when a specific tourist destination is chosen. Europe ranks first in the world (Figure 1), since its tourist destinations are within easy access of the main issuing markets. The Mediterranean, one of the world's top destinations, is also closely associated with a North and Central European demand for tourism (the strongest in the world), while the Caribbean, to cite an equivalent example, is dependent on a Central and North-American demand (World Tourism Organization (WTO) 2007).

[1] This paper was finished in 2012.

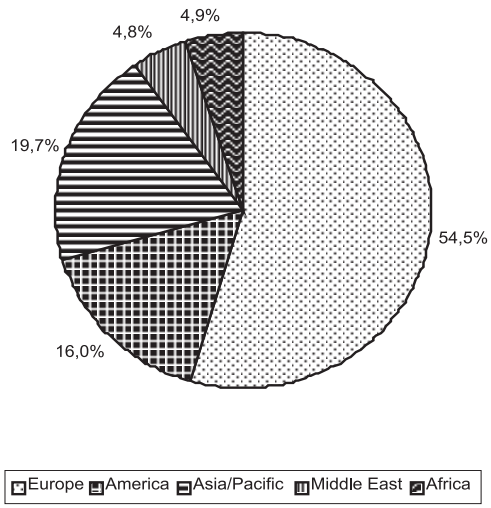


Figure 1. International tourist arrivals by destination regions, 2006
Source: Own, based on WTO data, 2007

The Mediterranean is thus still a favourite tourist destination in this globalized world. The top two countries in terms of tourist arrivals, France and Spain, have long Mediterranean coastlines. It should also be noted that the Mediterranean is the second biggest destination for cruise-ship holidays, after the Caribbean, and the favourite region for European cruise-ship tourism (World Tourism Organization (WTO) 2007).

Transport is a fundamental component of an economic and spatial model based on tourism because it acts as an interface between tourists' countries of origin and holiday destinations. Thus transport is one of the key variables in tourism development today, because it conditions both tourist mobility in the latter's countries of origin and access to destinations. Air transport and tourist travel form an inseparable pair and, although air transport is not the main means of transport used in leisure travel (17% travel by air as opposed to 49% by car), it is in the case of international tourist travel (with percentages of 45% and 38% respectively). In the Balearic Islands, the Mediterranean's westernmost islands, airports were the gateway for 96% of the over twelve million tourists who travelled there in 2011. That is why, in this chapter, we focus on an analysis of traditional problems associated with this mode of transport and the changes that it has undergone, without forgetting the importance of sea travel for other Mediterranean tourist destinations, in the form of cruises (Martínez, Seguí, Petrus 2011, p.193).

The recent proliferation of attractive holiday destinations and the micro-segmentation of holiday products and the expectations they are conceived to meet are a response to the hypermobility of today's demand (Ramos 2005). In contrast with the one trip a year taken by traditional tourists, today's post-modern tourists take other shorter breaks throughout the year, in addition to seasonal holidays, visiting destinations that offer new experiences: rural get-back-to-nature holidays, the hedonic pleasure of thermal spa centres, the cosmopolitanism and avant-gardism of the big city, and adventure holidays in remote destinations. These new tourist patterns typical of post-modern hypermobility - motivated by increasingly fragmented holidays, more affordable prices, and more widespread use of the Internet, to cite just a few causes - have led to the emergence of a new mode of air traffic[2]: low-cost carriers (LCCs), whose market share has grown year by year[3].

As argued by Erik Cohen (2005, p.15), while globalization is standardizing the world, new focuses of attraction are appearing for tourists. Although a loss of diversity should, in theory, reduce destinations' appeal, travel is becoming an increasingly distinctive sign of post-modern societies. Low-cost travel is not exclusive to air transport, since it has now been extended to cruise ships, with a substantial reduction in prices, and even to new forms of accommodation. It is a new form of consumption and yet another expression of new mobilities in this globalized world, boosting affordable mobility while also generating new environmental challenges, including ones related to climate change. This is particularly important in the Mediterranean region, in its capacity as one of the world's top destinations.

The air travel market is a very fast-changing one (and this is even more true in the case of the low-cost sector), and although globalization is one of its causes, the air travel market is also seeing the effects of this phenomenon. In recent years, airline companies have been restructured at an international level, with changes in sales strategies, the creation of alliances to ensure a higher competitive capacity[4], mergers and disappearances. Spain and the Balearics have not been unaffected by this process. They have experienced closures and the relocation of companies, and some people have blamed new low-cost airlines for the restructuring that the sector has undergone since the beginning of the last decade and, more particularly, over the last five years. Until now, these LCCs have seen big growth rates, to the extent that, according to Merino (2008), they have forced traditional airline companies to take another look at their

[2] The history of low-cost airlines dates back to the early 1970s in the USA and the company *Southwest Airlines*. The first low-cost carrier in Europe was *Ryanair*, in the mid 1980s, ten years before the liberalization of the European market, with a daily flight between Ireland and England (Noguera 2006, p. 37-38).

[3] According to the Spanish Institute for Tourism Studies (Instituto de Estudios Turísticos 2008, p. 87-88), Low-Cost Carriers are defined by a series of characteristics that generally distinguish them from "traditional" airline companies, even if they do not share all of them. Representative characteristics include direct sales to passengers (via the Internet or the phone using call centres); they do not issue tickets; they do not have offices abroad; they do not have loyalty programmes; they do not have on-board services (no food, newspapers or magazines); they minimize their operational costs (thanks to higher productivity, lower maintenance costs, no profit margins lost to travel agents, the type of plane etc); they mainly use scheduled flights; they maximize the occupancy and use of their planes (with a greater number of flights per day per plane), they minimize the time an aircraft spends on the ground at each airport; they maximize flexibility in the purchase of trips (one way, return), they do not have a business class or first class; they use standard aircraft; they are independent companies (not attached to tour operators or traditional airline companies); they do not make connecting flights (giving priority to door-to-door flights); they do not sell seats as part of a package holiday; they use marketing strategies based almost exclusively on prices; they do not have numbered seats. For further details of their features, see too: Page 2009, p.86.

[4] Oneworld, Sky Team and Star Alliance are estimated as accounting for over 50 per cent of world air passenger traffic (Page 2009, p.55).

management models and adopt strategies similar to them. A good example of recent changes in Spain is the merger of two LCCs, *Vueling* and *Clickair* (the latter owned by *Iberia*).

New LCCs have gradually taken over what were traditionally charter routes. They have gone one step further too, since they also compete with the scheduled airline or traditional airline market, because they are more efficient at offering the *à la carte* style of travel in keeping with the new post-Fordist model of tourism, characterized by differentiation. Their operations have increased[5] and their future prospects point toward a growth in passenger movements, meaning that their level of sustainability is no better than other more traditional forms of air transport. True enough, the Open Skies Agreement of March 30th 2008 - by virtue of which all EU airline companies can make direct flights to the USA from anywhere in Europe and not just from their country of origin- will necessarily increase competition and reduce the price of flights, opening up new opportunities for transatlantic routes for this type of company (Francis et al. 2007). The European Commission estimates that this type of passenger will rise by 50% (Merino 2008).

As a general rule, LCCs operate direct routes, avoiding hubs created by airlines that form part of an alliance at airports with more traffic and higher taxes (Hernández 2008 a). LCCs use secondary airports and they help boost the transport links and economies of cities where they operate, giving them a visibility that they lacked. LCCs position new provincial, hitherto marginalized destinations and home airports on the European tourism market, generating flows where these were lacking. Flights are also operated outside holiday periods because they are scheduled, encouraging people to travel at times other than those conventionally established by charter companies. At the same time, for local residents, they generate more mobility and a wider network of destinations, with no stopovers and access to more affordable fares. This is why we claim that these new types of flights create a demand, generating new mobilities, not just by luring passengers away from so-called traditional airlines but also because of the new kind of trips they give rise to.

Son Sant Joan Airport (in Palma de Mallorca, the Balearics) has been the most widely used airport by LCCs in Spain over the last five years, followed by Barcelona and Malaga Airports (Instituto de Estudios Turísticos 2011). It has become a hub for the LCC, *Air Berlin.* The use of a hub by an LCC (a strategy used by traditional airlines belonging to an alliance as a means of minimizing resources) makes Mallorca Airport unique in this door-to-door mode of air travel.

The first part of the chapter makes a detailed analysis of the impact of LCCs in Spain and the Balearics over the last five years in their capacity as new modes of air travel in a global market symbolic of the hypermobility of today's developed societies. These new modes and their impacts have been added to the Balearic tourism monoculture's pre-existing problems. The second part of the chapter analyses the relationship between tourism and air transport and their environmental impacts. This is a highly topical subject, since it is directly associated with climate change and transport's contribution to the latter.

The chapter takes an analytical descriptive approach, because, as pointed out by Urry, a critique-based approach to the paradigm of hypermobility would entail examining how and why there is an apparent desire for physical travel and how social networks (meetings or leisure travel), distributed across specific geographical areas, influence mobilities (Larsen et al. 2006).

2. European tourist flows to Spain. Low-cost carriers

The greater majority of Europe's international flights are handled by those countries with a higher population, countries that are tourist destinations, or countries where airport hubs with the highest traffic are concentrated. Over the last five years, five countries – the United Kingdom, Germany, France, Italy and Spain – received over half these flights. Flights operated by LCCs in the UK and Spain stand out particularly (Instituto de Estudios Turísticos 2008, 2011). The number of international passengers arriving in Spain has continued to grow in recent years. Only in 2009 did the number drop as a result of the international economic situation, which affected the airline industry generally. In 2011, European international air traffic to Spain amounted to over 63 million passengers, and LCCs accounted for almost 57% of the international demand. LCCs' market share has grown since 2003, initially at the expense of traditional airlines, which experienced a drop in passengers until the year 2008, aside from the occasional exception. Following the widespread decrease in passenger numbers in 2009, the international air traffic market has gradually recovered, with LCCs undergoing the biggest increases (Instituto de Estudios Turísticos 2011).

Relations among tourism, air transport and LCCs become even clearer when an analysis is made of issuing markets and the importance of flights by LCCs in their respective countries and in the destination country, Spain.

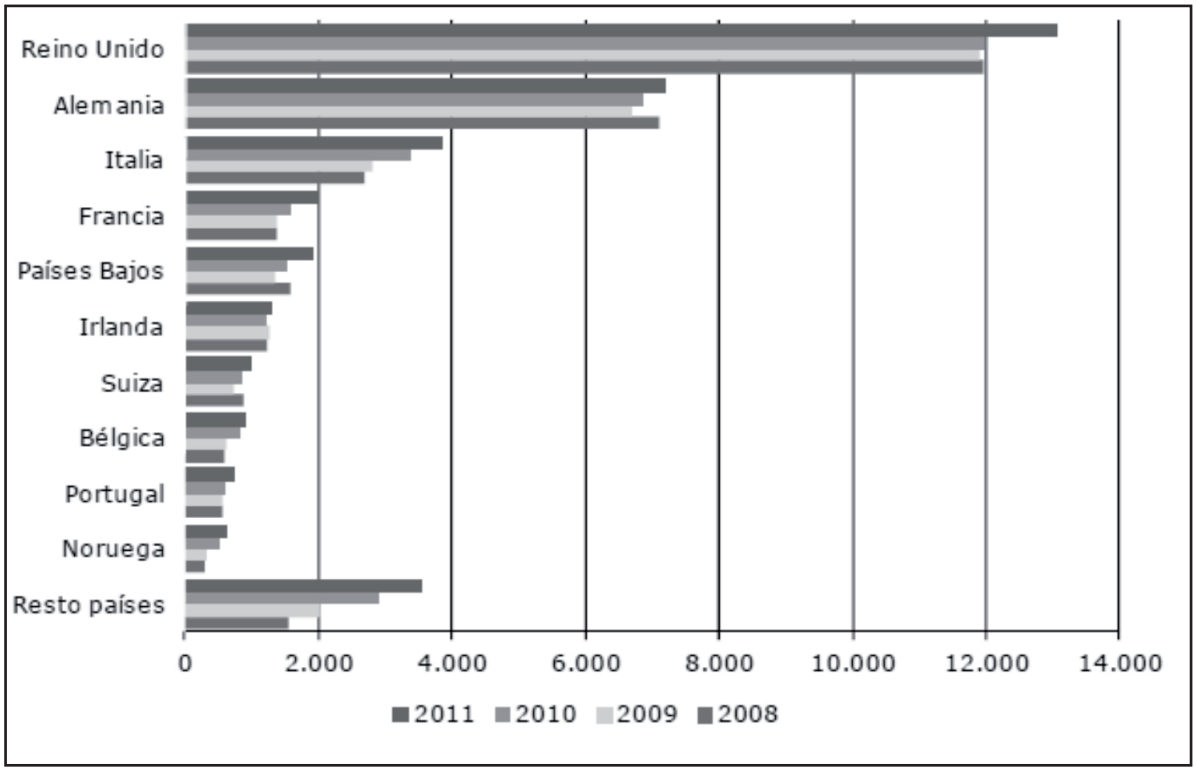
In 2011, some 27 million passengers travelled to Spain by air from the United Kingdom and Germany, the main issuing markets for tourism, accounting for approximately less than half all international arrivals. The Balearics and the Canaries received the greatest number of LCC flows.

The UK, with a figure of 15.8 million passengers (25% of all tourist arrivals to Spain), was the leading issuing country for both LCCs and traditional airlines, with about 80% these flights being operated by LCCs. Germany was the second most important issuing market, accounting for 18% of all international arrivals. The main destination for German flights was also Spain, with Germany representing 17% of all tourist arrivals to Spain, with a figure of 11 million passengers. Over 64% of these German passengers travelled with a LCC and Spain was also the main destination for its low-cost flights. The UK and Germany together accounted for over 56% of all LCC passengers to Spain (with a figure of 13 million passengers for the UK and 7 million passengers for Germany

[5] In 1995, Easy Jet carried a total of 30,000 passengers. By 2007, the figure had risen to 37.2 million (Page 2009, p.89).

in 2011). Together, they had a market share of over 56% of all LCC passengers to Spain, while all the remaining issuing countries lagged far behind (Figure 2) (Instituto de Estudios Turísticos 2008, 2011).

Despite the importance of these two markets, there is an increasing trend toward the use of LCCs by passengers from other countries too, like France and Holland, and as each year passes they account for an increasing share of international arrivals to Spain.



(Thousands)

Figure 2. International passenger arrivals to Spain on LCCs by country of origin. 2008-2011
Source: Instituto de Estudios Turísticos, 2011

Since 2010, the Balearics have been the top destination for LCCs to Spain. Among the ten most important flight routes, we found four flight connections between Son Sant Joan Airport (Mallorca) and Cologne, Dusseldorf, Hamburg and Dortmund, mainly generated by the introduction of *Air Berlin*'s hub. Of all Spain's airports, Son Sant Joan is the one that has received the highest number of international LCC arrivals over the last six years (6.1 million passengers, representing 17% of all LCC traffic in 2011), since four out of every ten travellers were German in 2011 and three out of every ten were British. Indeed, routes from issuing markets in Germany and the United Kingdom to the Balearics, accounting for 4.2 and 3.1 million passengers respectively, were the most heavily used routes between Spain and the rest of Europe, whilst in the case of routes by LCCs, German passengers were also the most numerous to the Balearics, accounting for a total of 3.5 million passengers. These movements not only encompass holiday trips, mainly concentrated in the summer, but also long-stay tourist travel and flights by tourists with second homes.

2.1 The composition and spatial distribution of LCC flows in Spain

From among the over 63 million international passengers to Spain in 2011, 36 million arrived on LCCs and 27 million on traditional airlines. Of all Spain's self-governing regions (NUTS[6] 2), six alone - the most touristic ones, mainly located on the Mediterranean coast, plus Madrid's hub - were responsible for these flows. They were Madrid (25%), Catalonia (20%), the Balearics (16.5%) in third place, the Canaries (16.4%), Andalusia (9.8%) and the Valencia region (8.6%) (Instituto de Estudios Turísticos 2011).

The distribution of LCC flows by self-governing regions mainly reflects the presence of tourism, with a change in the ranks of the self-governing regions in relation to general air traffic flows. In 2011, the Balearics - the top tourist destination for LCCs - accounted for 21.6% of all LCC arrivals (7.8 million passengers), followed by Catalonia (19.9% of the demand, with 7.2 million passengers), the Canaries (17.1%, with 7.1 million), Andalusia (13.8%, with 5 million), the Valencia region (13.2%, with 4.7 million) and Madrid (10.4%, with 3.7 million). Madrid is Spain's biggest hub for international and domestic flights and it was also the airport that received the highest volume of international passengers travelling on traditional airlines (Figure 3).

As with previous years, the top airports for LCC passenger arrivals were Mediterranean ones: Son Sant Joan in Palma (Mallorca) and Barcelona and Malaga Airports. Palma received

[6] Common regional classification in the EU, called "nomenclature of territorial units for statistics (NUT). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003R1059:EN:HTML. Accessed September 2010.

the most international LCC traffic, with a total of 6.1 million passengers (17% of all LCC passengers to Spain), mainly from airports in Germany and the UK. Barcelona Airport, with 5.4 million LCC passengers, ranked second as the Spanish airport with the most LCC traffic. It mainly received passengers from three markets: the United Kingdom Italy and France. Malaga held third place, with 3.9 million passengers, with the UK as its main issuing market (Figure 4).

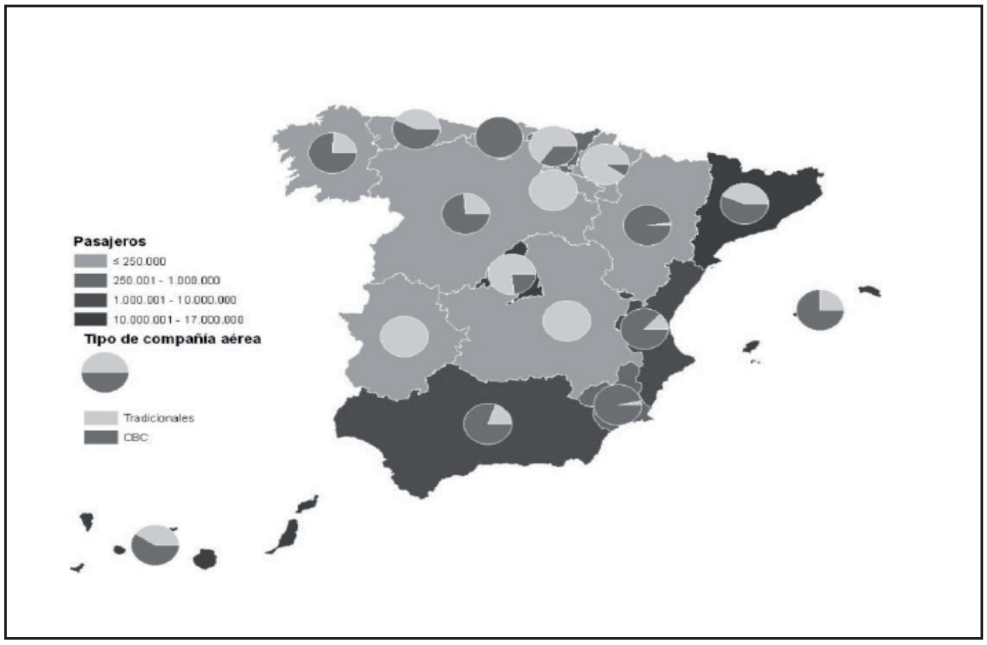
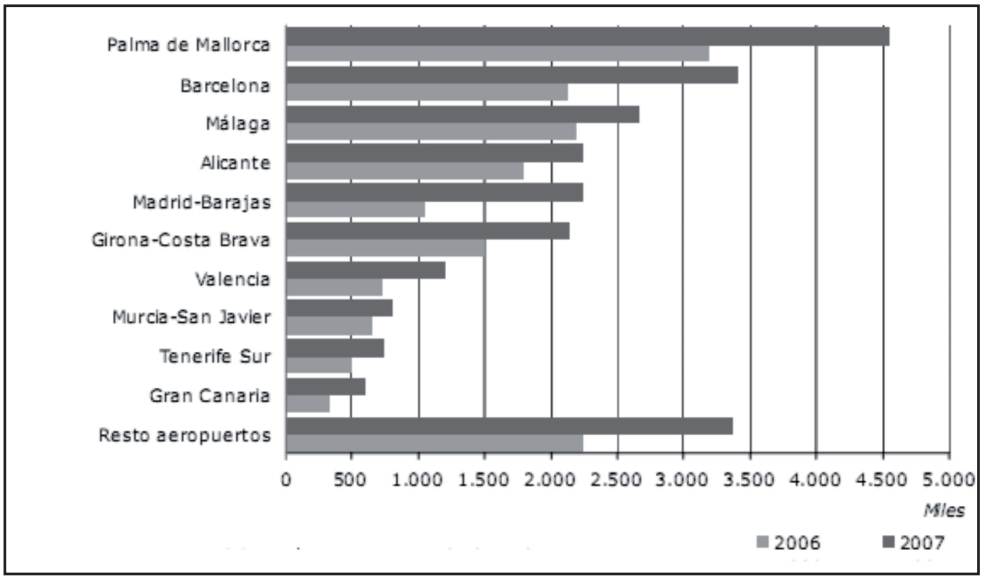


Figure 3. International passenger arrivals to Spain by the self-governing regions receiving them, 2008 and 2011
2011 (Passengers, Type of airline, Traditional, LCCs)
Source: Instituto de Estudios Turísticos, 2008, 2011

The main self-governing regions to receive the 13 million Britons who visited Spain on LCCs in 2011 were the Canaries, the Balearics, Catalonia and Andalusia, accounting for 76% of all LCC passengers. The top destinations for traditional British airlines were the Canaries, Madrid, the Balearics and Catalonia. Most German LCC traffic (7.1 million passengers in total) travelled to the Balearics, the Canaries and Catalonia, as was also the case of passengers on traditional airlines, with the addition of Madrid. The company carrying the most passengers to the Balearics was *Air Berlin.*



(Thousands)

Figure 4. International passengers travelling to Spain on LCCs by the airports receiving them, 2006-2007.
Source: Instituto de Estudios Turísticos, 2008

3. Tourist traffic in the Balearic Islands

Because the growth of tourism has gone hand in hand with a growth in flight connections, the Balearics are an average of just 2 hours away from Europe's main capitals. Given the archipelago's insular Western Mediterranean location, most tourist flows (96%) are by air. Mallorca, Minorca and Ibiza each have an airport, with Son Sant Joan Airport in Palma (Mallorca) acting as the gateway for most movements (73%). 80% of all passengers travelling by air are tourists[7], with this figure remaining stable except for slight fluctuations in the 1960s.

The evolution of Balearic air traffic highlights the region's dependence on tour operators and, traditionally, on charter companies. This situation has changed radically today, due to the impact of low-cost flights. The Balearics were the Spanish self-governing region with the third highest international passenger arrivals in 2011 (10.4 million). Balearic airports are a gateway for 16.5% of the over 63 million international arrivals to Spain by air. Thanks to the major role in tourism played by the Balearics' biggest airport, Son Sant Joan, it is the Spanish airport with the third highest overall passenger figures, behind Madrid and Barcelona, which rank fifth and ninth in Europe for their volume of passenger traffic (AENA 2011). Son Sant Joan is the airport with the highest volume of LCC traffic in Spain and it ranks fifteenth among Europe's top twenty European airports, in front of the airports of capital cities with fewer passengers like Copenhagen, Oslo and Vienna. However, given the low level of diversification of its issuing markets, with 70% of its passengers concentrated in the United Kingdom and Germany, there is an imbalance in connections to other destinations, with other international flight connections necessarily entailing stopovers in Madrid or Barcelona, thus necessitating a greater number of flights, longer travel time and higher cost. *Iberia*'s progressive relocation from El Prat Airport in Barcelona to Madrid's Terminal 4 and the disappearance of *Spanair* in 2011 have had a negative impact on the Balearics, because they have lengthened many indirect flights from the Balearics.

Since the 1960s, tourism has been the driving force behind constant increases in air traffic. The number of visitors has doubled over the last two decades (Table 1) and 1990's six million tourists have become over twelve million today.

Table 1. Evolution in the number of tourists to the Balearics

Year	Tourists (000)
1990	6,068
1995	8,189
2000	10,800
2005	11,626
2006	12,577
2007	13,275
2008	13,104
2009	11,433
2010	11,349
2011	12,316

Source: Govern de les Illes Balears (several years)

[7] In the case of maritime transport, 20% of all passengers are tourists.

Passenger arrivals and departures from Balearic airports as a whole have evolved in tandem (Table 2). The 15-million passenger figure for the Balearics in the early 1990s has now risen to almost thirty-one million, and so this traffic has practically doubled. This is a growth rate similar to that recorded for European airports as a whole for the same period.

Table 2. Evolution in passenger numbers at Balearic airports (arrivals and departures)

Year	Balearic airports (000)	Son Sant Joan (Mallorca) (000)
1990	15,272	11,334
1995	20,166	14,733
2000	26,659	19,411
2005	27,996	21,241
2006	29,559	22,408
2007	30,766	23,228
2008	30,082	22,833
2009	28,190	21,202
2010	28,670	21,117
2011	30.945	22,726

Source: Govern de les Illes Balears, 2009, 2012

After several decades of uninterrupted growth, in 2008 and 2009 the effects of the world economic crisis made themselves felt and there was a drop in passenger traffic to Balearic airports as a whole of 8%, representing almost 2.5 million passengers (Table 2). This decrease in passengers was bigger in the case of Ibiza and Minorca, since, due to their size and characteristics, they are more sensitive to fluctuations in the international tourist market (Govern de les Illes Balears 2009). The recovery started in 2010 and, in 2011, passenger traffic surpassed the 2007 figure. The distribution of international air traffic in 2008 - which is similar to the current distribution - reflects the predominance of tourist traffic, accounting for 67% of all arrivals and departures to the Balearics as a whole and 72% in the case of the region's most international airport, Son Sant Joan. Domestic traffic accounted for just over one quarter of the air traffic, while internal air traffic within the Balearic Islands accounted for less than 5% (Table 3).

Table 3. Distribution of air traffic to the Balearic Islands (arrivals and departures), 2008

	Total	Intra-Balearic	Domestic	International
Balearic airports	30,082,155 (100)	1,362,083 (4.53%)	8,419,610 (28%)	20,285,832 (67.4%)
Son Sant Joan (Mallorca)	22,832,947 (100)	668,100 (2.9%)	5,663,418 (24.8%)	16,501,429 (72.27%)

Source: Govern de les Illes Balears, 2009, and own

Today scheduled traffic predominates, accounting for 77% of all flows (Table 4), while until the year 2000 charter traffic

prevailed. The driving force behind this change are international LCCs, to which charter passengers have been redirected, while LCCs have also absorbed scheduled traffic from other popular routes, like the Palma- Madrid or Palma-Barcelona ones.

Table 4. Composition of air traffic by typologies in the Balearics (arrivals and departures), 2008

TRAFFIC	SCHEDULED		CHARTER		TOTAL	
	Balearic Airports	*Son Sant Joan (Mallorca)*	*Balearic Airports*	*Son Sant Joan (Mallorca)*	*Balearic Airports*	*Son Sant Joan (Mallorca)*
DOMESTIC	9,553,571	6,244,764	213,833	84,655	9,767,404	6,329,4219
	-98%	-99%			-100%	-100%
INTERNATIONAL	13,460,151	11,850,576	6,806,861	4,645,090	20,287,012	16,495,666
	-66%	-72%	-34%	-28%	-100%	-100%
OTHERS	47,739	7,862			47,739	7,862
TOTAL	**23,061,461**	**18,103,202**	**7,020,694**	**4,729,745**	**30,082,155**	**22,832,947**
	-77%	**-79%**	**-23%**	**-21%**	**-100%**	**-100%**

Source: Govern de les Illes Balears, 2009, and own

As indicated previously, two nationalities account for the majority of the tourist traffic (Germans and Britons), both at a Spanish and Balearic level. However, there are big differences between them in the significance of this traffic (Tables 5 and 6).

In 2011, the Balearics received 38% of all German passenger traffic to Spain, (traffic that, in turn, represented 17.4% of all international arrivals by air to Spain, with a figure of 11.1 million passengers). The archipelago also received 20% of all British passengers to Spain, (24.8% of all international air arrivals to Spain, with a figure of 15.8 million passengers). At a Balearic level, Germans accounted for 40% of all passenger arrivals, with a figure of 4.2 million travellers, while the British accounted for 30% of all movements, with 3.1 million travellers. In conjunction, the Germans and British account for 70% of all international arrivals to the Balearics, with the scope of influence of German flights extending to its neighbouring country, Austria.

Table 5. Passenger arrivals to Spain by air, by country of origin and by the destination self-governing region, 2011

	Madrid	Catalonia	Balearics	Canaries	Andalusia	Valencia region	Basque Country	Others	TOTAL
UK	1,419,693	1,851,130	3,184,908	3,624,885	2,502,223	2,343,939	126,928	718,499	15,772,205
Germany	1,266,656	1,469,846	4,212,188	2,730,360	684,226	427,964	252,122	39,173	11,082,535
Italy	2,021,706	1,762,578	597,186	305,220	445,536	526,828	38,917	187,644	5,885,615
France	1,639,409	1,258,184	332,338	196,436	569,731	343,522	89,474	149,830	4,578,924
Holland	600,318	872,889	246,000	413,156	326,119	316,229	19,276	12,250	2,806,237
Switzerland	579,262	647,266	414,989	212,395	183,384	186,494	3,105	30,542	2,257,437
Belgium	440,473	471,475	138,813	361,618	321,927	234,639	51,248	103,521	2,123,714
Portugal	834,868	461,206	147,942	60,089	19,328	63,889	20,502	4	1,611,661
USA	1,109,618	361,668	120	18	11,231	7,155	13	34	1,489,857
Ireland	159,036	253,744	121,394	405,400	292,698	125,090	13,412	59,677	1,430,451
Sweden	78,265	235,165	195,141	447,163	125,448	140,852	5	2	1,222,041
Norway	31,204	118,035	124,667	440,258	151,283	228,667	3	27,458	1,121,575
Denmark	154,914	225,555	172,288	320,350	162,081	62,746	2	206	1,098,142
Russian Federation	152,285	469,940	66,570	68,990	36,304	27,464	0	33	821,586
Morocco	413,535	246,379	9,132	30,585	31,923	52,820	1	64	784,439
Other countries	5,285,355	2,087,739	490,595	742,625	342,769	381,118	16,607	66,460	9,413,268
TOTAL	**16,186,597**	**12,792,799**	**10,454,271**	**10,359,548**	**6,206,211**	**5,469,416**	**631,615**	**1,399,230**	**63,499,687**

Source: Instituto de Estudios Turísticos, 2011

Table 6. Passenger arrivals to Spain on LCCs and traditional airlines, by country of origin, 2011

	All passengers		Vertical percentages		Horizontal percentages	
	LCC	T	LCC	T	LCC	T
UK	13,073,138	2,699,067	36.2	9.9	82.9	17.1
Germany	7,188,829	3,893,706	19.9	14.2	64.9	35.1
Italy	3,869,692	2,015,923	10.7	7.4	65.7	34.3
France	1,991,871	2,587,053	5.5	9.4	43.5	56.5
Holland	1,903,811	902,426	5.3	3.3	67.8	32.2
Ireland	1,298,494	131,957	5,0	0.5	90.8	9.2
Switzerland	1,002,272	1,255,165	2.8	4.6	44.4	55.6
Belgium	917,266	1,206,448	2..5	4.4	43.2	56.8
Portugal	725,355	886,306	2.0	3.2	45.0	55.0
Norway	601,487	520,088	1.7	1.9	53.6	46.4
Morocco	502,831	281,608	1.4	1.0	64.1	35.9
Sweden	484,008	738,033	1.3	2.7	39.6	60.4
Denmark	421,134	677,008	1.2	2.5	38.3	61.7
USA	60,095	1,429,762	0.2	5.2	4.0	96.0
Russian Federation	42,371	779,215	0.1	2.8	5.2	94.8
Other countries	2,021,786	7,391,482	5.6	27.0	21.5	78.5
TOTAL	**36,104,440**	**27,395,247**	**100.0**	**100.0**	**56.9**	**43.1**

Source: Instituto de Estudios Turísticos, 2011

3.1 LCCs and traditional airlines: Son Sant Joan Airport and tourist flows.

Certain qualitative and quantitative changes in the demand for air transport have transformed the dynamics of the Balearics' airports, especially Son Sant Joan Airport. Not only have LCCs generated a drop in passenger traffic on traditional airlines - particularly in terms of international traffic, which is the focus of this chapter -, but generally speaking they have also helped to reduce the seasonality of tourist flows (a problem that was a genuine thorn in the flesh in terms of tourist facilities and the occupancy of tourist destinations with a hot climate, like the Balearics and other Mediterranean destinations in general).

If we focus on traditional airline traffic to Spain, in 2011 passengers to the Balearics represented 9% of these flows, with the destination ranking fourth among Spain's self-governing regions, headed by Madrid (45.4%), Catalonia (20.4%) and the Canaries (15.3%), whilst Andalusia (4.4%) lagged somewhat behind in fifth position.

Traditional airlines carrying international passengers to the Balearics have seen a 10% growth in traffic compared with 2010 (7.7% higher than the average national growth), with Britons and Germans making up 47% of passengers arrivals.

Table 7. Passenger arrivals to Spain on traditional airlines, by country of origin and by the destination self-governing region, 2011

	Madrid	Catalonia	Balearics	Canaries	Andalusia	Valencia region	Basque Country	Others	TOTAL
Germany	1,105,257	730,404	921,341	762,645	117,866	20,491	232,768	2,934	3,893,706
UK	702,549	455,333	835,338	483,642	149,075	71,471	586	1.073	2,699,067
France	1,163,334	465,307	159,156	215,878	241,470	163,816	89,474	88,618	2,587,053
Italy	1,186,773	336,954	92,941	273,369	69,087	48,271	1,687	6,841	2,015,923
USA	1,049,523	361,668	18	120	11,231	7,155	13	34	1,429,762
Switzerland	450,745	371,018	84,669	157,927	93,893	95,633	153	1.127	1,255,165
Belgium	287,107	151,714	279,498	96,242	218,364	99,698	51,248	22,577	1,206,448
Holland	461,598	303,385	99,781	25,573	10,280	757	143	909	902,426
Portugal	572,108	200,728	33,687	17,828	19,328	18,420	20,502	3,705	886,306
Russian Federation	152,285	427,569	68,990	66,570	36,304	27,464	0	33	779,215
Sweden	58,854	111,389	412,493	145,246	9,536	508	5	2	738,033
Denmark	152,389	137,476	261,173	109,620	14,933	1.209	2	206	677,008
Norway	8,441	28,489	317,380	80,306	28,283	54,686	3	2,500	520,088
Argentina	446,917	44,088	6	9	0	16	0	0	491,036
Brazil	408,473	34,233	15	7	3	6	0	5	442,742
Other countries	4,237,462	635,700	1,440,508	213,866	189,256	110,403	16,616	27,458	6,871,269
TOTAL	**12,443,815**	**5,600,263**	**4,202,186**	**2,648,848**	**1,208,909**	**720,004**	**413,200**	**158,022**	**27,395,247**

Source: Instituto de Estudios Turísticos, 2011

The Balearics ranked third as a destination for German and British traditional airlines, preceded by Madrid and the Canaries, because these airlines carried 19.6% of all German passengers (0.8 million people) and 17.9% of all British ones (0.5 million people). Whilst German travellers represented 28.8% of all Balearic traffic, a figure that doubled the percentage of German traffic to Spain as a whole (14.2%), Britons accounted for 18.3% of all traffic to the archipelago, with this figure also doubling the percentage of British air arrivals to Spain (9.9%).

In the same year, the Balearics received 7.80 million LCC passengers, an increase of 11% in relation to the previous year (Table 8). Two countries accounted for eight out of every ten passenger arrivals. German LCC traffic to the Balearics (44% of the total, with a figure of 3.45 million passengers) doubled the percentage of German traffic to Spain as a whole (20%), with the Balearics receiving almost five out of every ten German LCC passengers to Spain (48%).

With a figure of 2.7 million LCC passengers, the United Kingdom accounted for 34.6% of all LCC arrivals to the Balearics, although this percentage was very similar to British flows to the whole of Spain (36.2%).

German and British passengers represented 79% of all Balearic LCC traffic. The remaining countries, most of them bordering Germany, made relatively insignificant contributions in terms of passenger numbers when compared to both the latter. Switzerland, Austria, Holland, Italy and Portugal were the most representative. The latter (a destination for *Air Berlin's* hub, together with other Spanish destinations) accounted for 1.7% of all Balearic LCC traffic, with a figure of just 130,114 passengers. Even so, this figure still represents 20% of all Portuguese low-cost traffic to Spain.

Table 8. Passenger arrivals to Spain on LCCs, by country of origin and by the destination self-governing region, 2011

	Balearics	Catalonia	Canaries	Andalusia	Valencia region	Madrid	Murcia	Others	TOTAL
UK	2,701,266	1,395,797	2,789,547	2,353,148	2,272,468	717,144	497,714	346,054	13,073,138
Germany	3,449,543	739,442	1,809,019	566,3600	407,473	161,399	0	55,593	7,188,829
Italy	323,817	1,425,624	212,2790	376,4490	478,557	834,933	0	218,033	3,869,692
France	116,460	792,877	37,2800	328,2610	179,706	476,075	0	61,212	1,991,871
Holland	220,427	569,504	313,3750	315,8390	315,472	138,720	0	30,474	1,903,811
Ireland	99,344	240,805	350,6760	286,4390	124,435	124,304	42,298	30,193	1,298,494
Switzerland	257,062	276,248	127,7260	89,4910	90,861	128,517	0	32,367	1,002,272
Belgium	42,571	319,761	82,1200	103,5630	134,941	153,366	0	80,944	917,266
Portugal	130,114	260,478	26,4020	0	45,469	262,760	0	132	725,355
Norway	44,361	89,546	122,8780	123,0000	173,981	22,763	24,932	26	601,487
Morocco	0,000	165,510	3.356	15,4860	40,478	278,001	0	0	502,831
Sweden	49,895	123,776	34,6700	115,9120	140,344	19,411	0	0	484,008
Austria	244,956	78,612	85,7390	33,1470	10,609	14,013	0	0	467,076
Denmark	62,668	88,079	59,1770	147,1480	61,537	2,525	0	0	421,134
Romania	164,000	120,472	0	29,5920	79,683	148,186	0	20,515	398,612
Other countries	62,775	506,005	103,1180	113,4670	193,398	260,665		19,136	1,258,564
TOTAL	**7,805,423**	**7,192,536**	**6,157,362**	**4,997,302**	**4,749,412**	**3,742,782**	**564,944**	**894,7**	**36,104,440**

Source: Instituto de Estudios Turísticos, 2011

As previously indicated, although LCCs have occupied an important position in passenger traffic to Spanish airports as a whole over the past three years - accounting for 57% of all movements in 2011 and almost thirty-six million passengers, as opposed to twenty-seven million on traditional airlines -, they take pride of place when it comes to Balearic passenger traffic, the top-ranking destination for this kind of flight, due to the importance of Son Sant Joan Airport. While international traffic to Son Sant Joan on traditional airlines amounted to 8% of all traditional airline traffic to Spain, the airport accounted for 17% of all Spain's LCC traffic. This makes it the Spanish airport most heavily used by low-cost companies.

Son Sant Joan received a total of 8.21 million passengers, 79% of all international traffic to the Balearics and 78% of the region's LCC traffic (with a figure of 6.1 million passengers). 75% of all the airport's international passengers arrived on LCCs. The presence of LCCs has also grown at other Balearic airports. Thus in Ibiza, 77% of the airport's 1.6 million passenger arrivals travelled on LCCs, while 71% of Minorca's 0.47 million international arrivals were LCC passengers (Table 9).

The creation of a hub at Son Sant Joan by the LCC *Air Berlin* played a key role in the implantation of low-cost flights in the Balearics. The hub is a central node for flights between northern European countries of origin and south-western European destinations - Spain and Portugal respectively - on routes with a high volume of air traffic (Noguera 2006).

Air Berlin is typified as being an LCC (Instituto de Estudios Turísticos 2008) although it shares certain features with traditional airlines. It was one of the first companies to sell flights online and it has a loyal portfolio of German tourist clients resident in Mallorca, although it has extended its market as each year passes and it is widely used by native residents. It was the first German company to fly from relatively secondary airports like Münster-Osnabrück, Nuremberg, Paderborn, Dresden and Dortmund, and today it flies to airports with a high volume of traffic (Palma de Mallorca) and to other more secondary ones (Reus, Tarragona). It can be defined as a "low-cost company that offers traditional services" (Noguera 2006, p. 48-50).

Table 9. Passengers to Balearic airports by traffic-related segments, 2011

AIRPORT	LCCs	%	Traditional	%	TOTAL	%
Palma	6,126,392	74.60	2,090,523	25.40	8,216,915	100
Ibiza	1,251,893	76.70	81.317	23.30	1,633,210	100
Minorca	427,138	70.70	177,008	29.30	604,146	100
Balearic airports	**7,805,423**	**74.66**	**2,648,848**	**25.33**	**10,454,271**	**100**
Spanish airports	**27,395,247**	**56.90**	**35,940,533**	**43.10**	**63,335,780**	**100**

Source: Instituto de Estudios Turísticos, 2011

The low-cost hub has transformed Mallorca into an airport that is unique when it comes to a mode of travel normally characterized by door-to-door flights. In 2007, the hub was monopolized almost exclusively by *Air Berlin* and *Niki*, which carried 45% of all LCC passengers to the Balearics and 50% of those passing through Son Sant Joan Airport. As mentioned above, this airport also receives a lower amount of traffic from scheduled airlines organized into alliances, although this traffic is more stable throughout the year. Likewise, it also receives charter traffic with a strong touristic component. Son Sant Joan is not the most attractive airport for this type of company, whose success largely depends on the type of airports they choose (Barret 2004; Warnock-Smith and Potter 2005; Pels et al. 2009). This is because in the summer months, in its capacity as a major tourist destination, Son Sant Joan becomes very congested and its airport taxes are on a par with top-ranking airports. Even so, its attraction for all kinds of tourist traffic can be observed.

As mentioned previously, the hub and other LCCs to the Balearics have transformed the region into the top-ranking Spanish destination for low-cost traffic, accounting for 21.6% of all passengers of this kind. Son Sant Joan Airport ranks first for this air traffic segment, followed by Catalonia (19.9%), the Canary Islands (17.1%) and Andalusia (13.8%) (Table 8). Recently allocated a new terminal, the hub has increased Son Sant Joan's capacity as a node nationally and at a European level by extending its network of direct destinations, situated at easy distances for residents in search of breaks at easily affordable prices, although flows are polarized toward the two main issuing markets. This is the case of German airports with the most flight connections to the Balearics (Frankfurt, Berlin and Hamburg), together with London, Brussels, Vienna and Lisbon.

Until now, the high demand for transport has been mirrored by the extension of related infrastructure. The surface area dedicated to transport facilities in the Balearics represents 6% of the region's built surface, covering over 2000 hectares. Of this infrastructure, over half is made up of airport facilities (OSE 2007). In our opinion, further extensions to Son Sant Joan's facilities are a controversial issue, given the size of the region, intermodal links between different areas, and this type of infrastructure's complex coexistence with residential and tourist-related uses, due to factors like noise pollution (over 63% of the population within a radius of one kilometre of Son Sant Joan Airport suffer from noise, Seguí et al. 2004). As for Ibiza and Minorca Airports, they have recently been renovated and enlarged.

The hub has certainly benefited Mallorca by helping to reduce the seasonality of traffic, since one quarter of its passenger movements remain constant throughout the year. However, it should be noted that this has implied new work to the airport so that it can handle operations mainly aimed at sending traffic from European airports on to destinations in Spain and Portugal, with quick turn-around times so as to ensure two daily return flights along these routes. The basic goal is to increase the capacity of the terminal used exclusively for this hub so that it can handle flows from the 32,000 yearly interconnections that AENA[8] expects this node to tackle in the immediate future.

Although substantial efforts have been made and there is abundant legislation on the matter, the subject of the airport versus spatial sustainability does not seem to have been resolved for several reasons. The economy of the Balearics is mainly based on tourism. Participative processes in local decision-making have not been the norm in a region mainly governed by right-wing parties. In addition, it must be added that the planning and management of airports are centralized and handled by AENA while spatial planning and management come under the authority of the Balearic Regional Government and Island Councils. However, extensions to the Balearics' airports entail impacts far greater than temporary local disturbances, since they would affect the whole of a region dependent on tourism, as well as endangering sustainable spatial planning models.

4. Tourism, air transport and environmental sustainability

Among the environmental impacts attributable to the holiday industry, transport-related ones are high up the list. This is clearly expressed in the last 2008 UNWTO study *Climate Change and Tourism. Responding to Global Change,* where the transport sector is quantified as being responsible for 75% of tourism's overall climate footprint. The same study highlights air transport's big contribution in relation to other modes of tourism transport and tourism services. Given that most air traffic handled by Balearic airports is tourism motivated and taking into account the growing importance of LCCs in this air traffic, we believe that it is well worth analysing new mobilities from a complementary environmental perspective as further input in our analysis of the case of the Balearic Islands.

Of all the main impacts associated with air transport on a local or global scale, we will deal with atmospheric pollution

[8] AENA, (*Aeropuertos Españoles de Navegación Aérea,* Spanish Airports Air Navigation), an independent body attached to the Ministry of Public Works and, by extension, to Central Government

caused by greenhouse gas emissions by aircraft. That is, water vapour, nitrogen oxide (N_2O) and carbon dioxide (CO_2), the last of which is commonly used as an indicator to assess the sector's sustainability. Consequently, let us leave aside equally important impacts, like land consumption or the commonly cited problem of noise pollution, to which we referred in the previous section. Carbon dioxide emissions into the atmosphere are no doubt the most serious environmental problem for air transport, since the effects are not merely local but global. Air transport's capacity to boost tourism flows also makes it one of the weakest points in the fight to ensure sustainable tourism.

As the report *Climate Change and Tourism. Responding to Global Challenges* mentions, of all the different segments involved in tourism, the one with the biggest atmospheric repercussions is air transport, since, at a worldwide level, 40% of all carbon gases attributable to tourism are caused by air transport. Thus it exceeds emissions by cars (32%), emissions from energy consumed in tourist lodgings (21%) and those originated by other complementary activities. If, however, we analyse CO_2 emissions solely by different modes of transport used in tourism travel, air traffic's share of these emissions rises to 60% (Figure 5).

Nonetheless, it is important to add that because air travel is the mode of transport with the highest international demand (WTO 2008, p. 2), 63% of emissions from air transport used in tourism occur during international travel and only 37% during domestic travel. In this last case, cars have the highest emissions: 85% of all CO_2 emissions caused by domestic tourism travel (Figure 6).

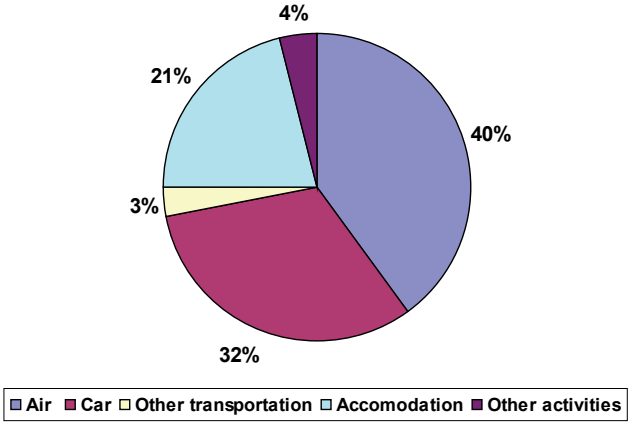


Figure 5. Modal Distribution of CO_2 Emissions for Tourist Travel. Worldwide Level, 2005
Excluding one-day trips (outings)
Source: own, based on UNWTO, 2008

There is no available original empirical data to make a similar specific analysis for the Balearic Islands, since existing emission inventories provide data at a state level and this information is not classified according to travel motives but by emission sources. Thus one pending issue is a more specific study, based on models where emissions from tourism flows can be derived from global Spanish airline emissions, with the added difficulty of attempting to define and classify mobilities whose motivations are increasingly hard to pinpoint.[9]

We believe that data from a study by the World Wildlife Fund (WWF 2009) offers a relevant approximation. In air travel between German airports and Son Sant Joan in Palma, this report rates each tourist as being responsible for 900 tons of $C0_2$. Our calculations, based on flight connections between Palma and Europe's main issuing markets, give average emission rates per passenger of 250kg and 300kg. [10]

Tourism's contribution to global warming highlights the problem of a very dynamic, expansive sector with a high-income capacity,[11] given the potential effects of climate change on tourist destinations that have paradoxically positioned themselves thanks to the development of air transport, as is the case of the Balearic Islands.

The Intergovernmental Panel on Climate Change (IPCC) has raised the alert that if the current trend toward an increase in carbon emissions is not halted, in just one century the world's destinations could see significant changes in their climates, such as hotter summers and winters and an increase in catastrophes due to extreme phenomena.[12]

Bearing in mind the fact that the climate plays a fundamental role in the location of tourism activities, particularly at destinations whose attractions and natural resources have led to the development of winter sports tourism or sun and sand holidays, in such a scenario changes in the direction of tourism flows can be expected. These flows might predictably move to higher latitudes and altitudes where new climatic conditions could lead to the emergence of new tourist destinations. We have already reflected on the current desire to visit somewhere different as one of the factors that determine today's new mobilities. In this process of climate change, southern regions - which are currently some of the most attractive in the world for tourism - would become less competitive (OMT and UNEP 2007). This is the case of Mediterranean Europe in general and, by extension, of Spain and the Balearic Islands.

Current debate on the sustainability of international air transport, which is interrelated with the sustainability of tourism, mainly revolves around reducing aircraft fuel consumption

[9] Published approximations can be found for various different destinations, calculated using a general model drawn up by the ICAO. This calculator is freely available online, with a very user-friendly interface. For details of the methodology behind the model, see http://www2.icao.int/en/carbonoffset/Documents/ICAO%20MethodologyV3.pdf. The carbon emissions calculator can be accessed athttp://www2.icao.int/en/carbonoffset/Pages/default.aspx.

[10] The data used for the WWF study – aircraft consumption per passenger/km for aircraft flying between Hamburg and Palma – was taken for the year 2007. If we use the ICAO's general carbon emissions calculator to calculate emissions for this route today, the results are better: 305.04 kg CO_2. We used this tool in our calculations for flight connections between London, Manchester, Dusseldorf, Cologne and Frankfurt Airports and Son Sant Joan in Palma.

[11] In 2011, worldwide revenue from international tourism alone amounted to one billion dollars, with Europe accounting for 463,000 million dollars and Spain 61,000 million dollars, WTO (2012).

[12] Some of the foreseeable direct effects of climate change are the disappearance of today's coastlines as we know them due to a rise in sea level, a decrease in marine and terrestrial biodiversity, droughts and water shortages, an increase in certain illnesses and even political destabilization due to tensions generated by these problems. The UNWTO (2008) anticipates a rise in sea level by 2100 of between 31 and 65 cm as the temperature of our oceans rises and glaciers melt.

and improving their ecoefficiency.[13] This is not a new concern, since in recent years a combination of progressively stricter legislation on greenhouse gas emissions, technical developments in engines, materials and design, and the development of alternative biofuels have all managed to bring down energy consumption and emissions by more modern aircraft.[14] With this, the negative relationship between an "increase in demand/increase in emissions" has been halted, because while the demand has grown by about 5% per year, emissions of CO_2 have risen by approximately 3% (ATG 2009). What is more, aircraft ecoefficiency has improved, so that it now represents 8% of the world GDP while emissions only account for 2% of all those caused by human activities (EADS 2007).

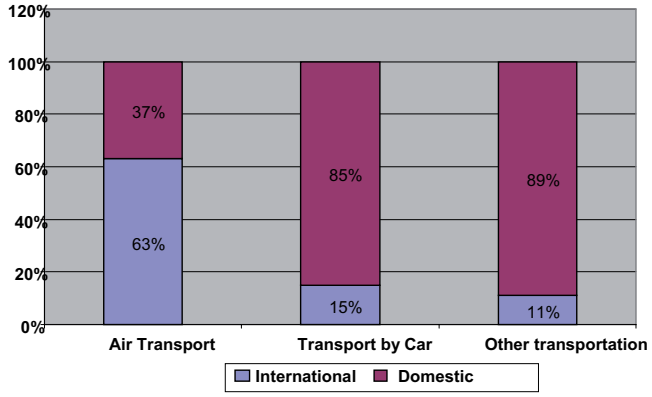


Figure 6. Distribution of CO_2 Emissions by Mode of Transport Used for Domestic and International Tourist Travel. Worldwide Level, 2005
Excluding one-day trips (outings)
Source: Own, based on UNWTO, 2008.

Nonetheless, despite these advances, global accounting seems to point to a continued rise in carbon dioxide emissions as each year passes due to an increase in movements and tourism flows, covering increasingly longer distances. This would double the CO_2 emissions by 2030 even though airlines were to invest in the most ecoefficient aircraft on the market, as they have done up until now.[15]

Following this general outline of the situation, given the geographical context and type of airline responsible for most tourism flows to the Balearics, we will now look at salient strategies that have been introduced in the European Union in the field of sustainable air transport, together with some of the results they have had, and the environmental performance of LCCs.

5. Low cost companies and sustainability in the European Union and Spain

In Europe, air transport is responsible for 12% of all carbon dioxide emissions by the transport sector (which in turn is responsible for 21% of all emissions). This situates the EU in a high position in the world ranks, since it is responsible for half the developed world's CO_2 emissions from international air transport (Flamarich 2009). Even so, if we look at air transport's share of carbon gas emissions in relation to other activities, it accounts for just 3% of them, a figure often cited by airlines in order to put the problem into perspective.

Tourism's influence on this phenomenon and its correlation in terms of sustainability are well exemplified by the following figures: air tourist travel accounts for just 20% of all modes of travel in the EU, yet its emissions represent 55% of all tourist transport emissions. Having said that, this percentage is lower than the world average, which stands at 60% (UNWTO 2008, pages 124-125). What is most worrying is the fact that, despite recommendations by experts, between 1990 and 2007, air transport emissions shot up by 98% in Europe and 138% in Spain instead of dropping (European Environment Agency 2011)[16] due to the sharp rise in air travel. As a result, during this period, it offset the effects of technical improvements and legal restrictions on the region's CO_2 emissions.

Between 1990 and 2006, the number of airline passengers in Europe rose by 114%, and forecasts by the European Environment Agency point to a 145% increase by 2010. Based on previous experience and these predictions, the equation must necessarily be rounded off by new increases in emissions. In response, the European Commission decided to introduce more restrictive legislative amendments to its environmental strategy, drafting more efficient emission control policies for the air transport sector. Two major European programmes come under the framework of these policies: "Clean Sky" and "Single European Sky ATM Research Programme (SESAR)".[17]

When we look at the European Environment Agency's data for 2010, the results are more encouraging, with a 7.7% drop in carbon dioxide emissions in relation to 2007 for the whole

[13] Ecoefficiency seeks to achieve a balance among the production of services, the resources that are used, and the generation of waste. Hence a sector is more ecoefficient if it is capable of offering more services while saving on resources and reducing impacts. It is commonly used as an indicator in studies that monitor the impacts of transport on climate change. In such contexts, an evaluation is made of the amount of fuel that is consumed per seat put on sale per 100 kilometres that is travelled. In the case of air transport, this indicator is used to assess technological improvements to fleets, together with the aircraft occupancy factor (Services and Studies for Air Navigation and Aeronautical Safety, SENA, 2010).

[14] One example is the 40% reduction in average fuel consumption when a late 1950s Boeing 707 is compared with the latest models. Generally speaking, since the 1960s aircraft have seen a 70% increase in energy efficiency (Hernández, 2008 a, p. 18; EADS, 2.007; ATAG, 2009).

[15] Ecoefficient aircraft are used as an argument by experts from the sector as important as the British association Sustainable Aviation, made up of leading airlines like British Airways and Virgin Atlantic, the aircraft manufacturer Airbus and the world's biggest airport operator, BAA (*Actualidad 24horas.com*, January 2009).

[16] These results only refer to $C0_2$ emissions from fuel combustion and not from other sources of emissions, which are not very important in the case of air transport. Likewise, when we talk about Europe, we are referring exclusively to the EU-15, since only this statistical group could be used to reconstruct a coherent series for the period under analysis.

[17] The aim of the Clean Sky project is to develop technological breakthrough projects in the aeronautical industry that can help reduce CO_2 emissions. The SESAR project, started in the 2008 is aimed at developing the necessary technology to guarantee fluid traffic and efficient management of the single European sky as a means of avoiding delays and congestion and the subsequent fuel costs that they involve.

of the EU-15 and an 8% drop in Spain. Nonetheless, this was a period of economic shrinkage, with big repercussions on the civil aviation sector, contradicting all forecasts. If we look at the available EUROSTAT data,[18] the European passenger demand for the period dropped by about 2%, with very uneven behaviour at a national and regional level. For instance, in Spain there was a drop of 6%, while in the Balearics the demand fell by 7%. It is hard to assess the impact of legal measures in a scenario of a slump in the demand. The positive emission results are probably partly attributable to the decrease in airline operations.

This year, as yet another step forward in the EU's environmental strategy, the CO_2 *Emission Trading Scheme* (ETS) for aviation has entered into force.[19] With this scheme, airline companies each have a maximum allowance of (free) greenhouse gas emissions. For 2012, this maximum allowance constitutes 97% of the airline's average recorded emissions during the years 2004 to 2006. For the period 2013-2020, the allowance will drop to 95% per year, using the same basis for calculations (European Parliament 2008).

Thus airlines are forced to reduce emissions by means of an assigned allowance, although this allowance can be extended through the purchase of additional amounts. This, however, pushes up the airline's running costs.[20]

The process of the aviation emission exchange programme's introduction was a somewhat uncertain one, due to the reticence of airlines from outside the European Union[21] and from within Europe. The same is also true of its short existence, since the European Commission continues to be pressurized to eliminate it.[22]

As for our immediate field of study, we should point out that allowance trading makes operations more expensive and this will have a knock-on effect on the final price of tickets. The European Commission calculates that they will go up by between 2 and 12 euros for long-haul return flights, depending on how the added costs of extending each company's individual allowance affects prices. However, it believes that it will not have a significant effect on the demand for short and medium-haul trips, like those generated by traffic at the Balearics' airports. On the other hand, LCCs, whose capacity to compete is based on very narrow profit margins, protest that it will no doubt have negative consequences for Mediterranean islands, given that their tourism demand is highly sensitive to increases in costs (Muñoz 2008). For the moment, we cannot tell which of the two forecasts is correct, but *Climate Change and Tourism. Responding to Global Challenges* warns that this is one of the negative economic consequences that are regarded as inevitable in the fight against climate change, possibly affecting the competitiveness of destinations.

Whatever the case, LCCs' unease is worth bearing in mind because, generally speaking, they have maintained a very advanced environmental policy, even if it is profit-motivated and image-related.[23] It must be remembered that LCCs have the most modern, efficient fleets on the market, such as B737s, B787s and Airbus 320s and 380s, which operate with less fuel and are therefore more economical when it comes to overall running costs. This type of aircraft accounts for up to 50% of all traffic to Balearic airports. Another key factor to take into account is the greater occupancy rate per flight on LCCs (around 85%) compared to traditional airlines (79%). Given all the above, these airlines can presume to be the most ecoefficient, with emission ratios per kilometre per passenger that are even lower than motor vehicle emissions,[24] in addition to their big competitive advantages over traditional airlines.

Thus from an environmental perspective, it is good news that Balearic tourism flows revolve increasingly around LCCs, since their fleets are the most efficient. However, LCCs' reticence with regard to the ETS and the economic repercussions of the latter are both causes of concern and future uncertainty.

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[18] EUROSTAT was used as a source in all cases in order to ensure methodological coherence in the processing of basic data and the standardization of the results.

[19] The European Emissions Trading Scheme (ETS) is the cornerstone of EU policies to combat climate change in compliance with agreements signed in 1997 as part of the United Nations Framework Convention on Climate Change. It entered into effect for the industrial sector in 2005 but the aviation industry's inclusion in the scheme did not begin to be legislated until 2008 (Directive 2008/101/EC). Spain implemented the directive through Act 5/2009 (which details the reporting obligations of airlines) and Act 137/2010, through which Act 1/2005 (which regulates the trading of emission allowances) was amended in order to adapt it to the aviation sector.

[20] As an example, we can cite the case of the British low cost carrier EasyJet. To cover its deficit for the present year (741,460 tons of CO_2 for 2012), it has had to buy additional allowances costing a total of 5 million euros, at a price of 7 euros per ton. The ETS market is very volatile. In 2011, the cost of emission allowances per ton of CO_2 fluctuated between 15 and 20 euros. This year, the price has even dropped to 6 euros and so, like other markets, there is a certain element of speculation (AVOCET, 2012; Pague and Serpa, 2012).

[21] Although many countries are against it, particularly Russia, China, India, the United States and Canada. The latter lodged a complaint with the European Court of Justice, which ratified the legality of the measure (Page and Serpa, 2012).

[22] Representatives of the European aviation industry (airlines and companies from the aeronautical sector, like Airbus) have expressed their concern about possible pressure by more belligerent countries from outside the EU, through action like the probable cancellation of contracts with the aeronautical industry or the introduction of taxes and limitations on traffic rights for European airlines on connections outside the EU (Page and Serpa, 2012; Apesteguía, E, 2012).

[23] Low-cost airlines make their environmental commitment known to the public through marketing campaigns. To cite two important examples for Balearic airports, EasyJet publishes an online emission report for users to read. It has also introduced its own environmental label as a commitment to customers and shareholders in the field of environmental transparency, and it uses this label as a means of differentiation (EasyJet). Air Berlin boasts a higher level of efficiency than Germany's leading airline, Lufthansa (GRENAIR, 2012), and it reports its decreasing consumption and emissions figures online.

[24] An airline company with a high occupancy rate and fleet of aircraft averaging about 4 years old. It has an average consumption of 95.7 and emissions of 95.7grams of CO_2 per passenger per kilometre. A car with the latest technology has emissions of about 100 grams of CO_2 per passenger per kilometre (Jordà, 2.008 p. 30).

6. Final considerations

Tourism today is one of the maximum exponents of globalization. Because air transport is the most commonly used mode of transport in international leisure travel and because the Mediterranean is one of the world's favourite destinations, the latter is quick to experience globalization-related changes in the sector.

Interrelations among tourism, air transport and LCC traffic have transformed the Western Mediterranean into one of Europe's leading regions in terms of LCC passenger arrivals. Given the sheer scope of the phenomenon and the Balearic archipelago's limited size and insular fragility, the subject of environmental sustainability obviously comes to the fore when this mode of transport is discussed.

The dynamics of the Balearic Islands' airports and, more specifically, those of Son Sant Joan have undergone recent qualitative and quantitative changes due to the emergence of LCCs. This new mode of air transport influences the demand, not just by diverting passengers away from traditional airlines but also through the generation of new types of travel that short-haul journeys facilitate. In addition to the reduced seasonality of flows, the creation of a hub by *Air Berlin* has boosted Mallorca's connectivity nationally and at a European level by enlarging its network of direct flight connections. However, this network is strongly biased toward flights to and from German and British airports in comparison with other destinations, because other international routes necessarily involve stopovers in Madrid and Barcelona, thus increasing the number of necessary flight connections, the travel time and cost while also aggravating the problem of sustainability.

Sustainable economic growth in the Balearic Islands – an archipelago with an economy heavily dominated by tourism since the 1960s - necessarily involves focusing on the environmental impacts of tourism, together with the closely related impacts of air transport. That is, the airports' capacity to handle traffic and the planning of the region's tourism model must be coordinated. From the perspective of environmental legislation, the region is clearly subject to European regulations and any pertinent action will therefore entail strict compliance with this legislation in our skies and airports. There seem to be no new risks inherent in continued efforts to boost LCC air traffic, because, as we have seen, these airlines compete within the framework of sustainability. Additionally, the LCC market encompasses a segment of demand in search of new tourist products not directly related with seasonal summer tourism. This is a broader market than the market targeted by traditional airlines. On the face of it, this could have positive consequences in terms of the relationship between tourism and the destination's natural environment.

Nonetheless, we must ask ourselves to what extent the success of LCCs might lead to big increases in Balearic air traffic in the future and what repercussions European policies in the field of environmental sustainability might have on this type of airline. These issues need to be addressed, because we must avoid a return to the growth model experienced up until now with traditional and charter airline companies. The revival of that kind of model would not only generate further local impacts – like changes in land uses, the transformation of the landscape and noise pollution – but it would also cause global impacts through greenhouse gas emissions. These, in the long run, would have a decisive influence on climate change and, by extension, on the region, economy and local society and those of other destinations, also negatively affecting their capacity to compete in the global marketplace.

It is hard to evaluate the approximate costs of these impacts on the economies of tourist destinations like the Balearics, however, they could well be high if we bear in mind the fact that about 80% of the region's wealth stems directly or indirectly from tourism. What is more, if the destination started to lose its appeal for its main sun and sand market, new modes of tourism that are also heavily conditioned by the archipelago's favourable climate might be even more effected.

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List of Abbreviations:

- AENA: Aeropuertos Españoles de Navegación Aérea, Spanish Airports Air Navigation
- BAA: British Airports Authority
- ETS: Emission Trading Scheme
- EU: European Union
- IATA: International Air Transport Association
- LCCs: Low-cost carriers
- NUTS: Nomenclature of Territorial Units for Statistics
- SESAR: Single European Sky ATM Research Programme
- UK: United Kingdom
- UNWTO: United Nations World Tourism Organisation
- USA: United States of America
- WTO: World Tourism Organisati

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